

## DEVICE TO DEVICE INTERFERENCE TRIGGERED HANDOVER

### BACKGROUND

**[0001]** 1. Field

**[0002]** Various communication systems may benefit from properly triggered handovers. For example, certain communication systems may benefit from device-to-device interference triggered handovers.

**[0003]** 2. Description of the Related Art

**[0004]** Proximity services (ProSe) for device-to-device (D2D) communications includes a number of different aspects to be addressed. Amongst those aspects are the co-existence of cellular D2D communications and how to handle the interference among D2D pairs. Hence, D2D radio resource and mobility management may be of value.

**[0005]** Mobility and interference management for D2D communications may help to permit efficient operation of simultaneously communicating D2D pairs or clusters in the same area. To optimize resource re-use and to avoid intolerable interference, D2D pairs or clusters may measure D2D beacons and report to the coordinating base station/network, or alternatively report to a master UE, such as in an out-of-coverage scenario.

### SUMMARY

**[0006]** According to certain embodiments, a method includes identifying, at a device, at least one strong device to device communication. The method also includes reporting, or initiating the reporting, the at least one strong device to device communication to a controlling node, wherein the controlling node is configured to control the device.

**[0007]** In certain embodiments, a method includes identifying a strong device to device communication based on a report received from a device. The method also includes determining whether to hand over at least one device based on whether the at least one device is part of strong device to device communication.

**[0008]** An apparatus, according to certain embodiments, may include at least one processor and at least one memory including computer program code. The at least one memory and the computer program code may be configured to, with the at least one processor, cause the apparatus at least to identify, at a device, at least one strong device to device communication. The at least one memory and the computer program code may also be configured to, with the at least one processor, cause the apparatus at least to report, or initiate the report of, the at least one strong device to device communication to a controlling node, wherein the controlling node is configured to control the device.

**[0009]** An apparatus, in certain embodiments, may include at least one processor and at least one memory including computer program code. The at least one memory and the computer program code may be configured to, with the at least one processor, cause the apparatus at least to identify a strong device to device communication based on a report received from a device. The at least one memory and the computer program code may also be configured to, with the at least one processor, cause the apparatus at least to determine whether to hand over at least one device based on whether the at least one device is part of strong device to device communication.

**[0010]** According to certain embodiments, an apparatus may include means for identifying, at a device, at least one strong device to device communication. The apparatus may also include means for reporting, or initiating the reporting, the at least one strong device to device communication to a controlling node, wherein the controlling node is configured to control the device.

**[0011]** In certain embodiments, an apparatus may include means for identifying a strong device to device communication based on a report received from a device. The apparatus may also include means for determining whether to hand over at least one device based on whether the at least one device is part of strong device to device communication.

**[0012]** A non-transitory computer-readable medium may, according to certain embodiments, be encoded with instructions that, when executed in hardware, perform a process. The process may include identifying, at a device, at least one strong device to device communication. The process may also include reporting, or initiating the reporting, the at least one strong device to device communication to a controlling node, wherein the controlling node is configured to control the device.

**[0013]** A non-transitory computer-readable medium may, in certain embodiments, be encoded with instructions that, when executed in hardware, perform a process. The process may include identifying a strong device to device communication based on a report received from a device. The process may also include determining whether to hand over at least one device based on whether the at least one device is part of strong device to device communication.

**[0014]** According to certain embodiments, a computer program product may encode instructions for performing a process. The process may include identifying, at a device, at least one strong device to device communication. The process may also include reporting, or initiating the reporting, the at least one strong device to device communication to a controlling node, wherein the controlling node is configured to control the device.

**[0015]** In certain embodiments, a computer program product may encode instructions for performing a process. The process may include identifying a strong device to device communication based on a report received from a device. The process may also include determining whether to hand over at least one device based on whether the at least one device is part of strong device to device communication.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0016]** For proper understanding of the invention, reference should be made to the accompanying drawings, wherein:

**[0017]** FIG. 1 illustrates a method according to certain embodiments.

**[0018]** FIG. 2 illustrates a signaling flow according to certain embodiments.

**[0019]** FIG. 3 illustrates a method according to certain embodiments.

**[0020]** FIG. 4 illustrates another method according to certain embodiments.

**[0021]** FIG. 5 illustrates a system according to certain embodiments.

### DETAILED DESCRIPTION

**[0022]** D2D user equipment devices (UEs) may sometimes be controlled by a network. However, at the cell-edge or